Some focus species of greatest conservation need

Jefferson's and Blue-spotted salamanders prefer to breed in wetlands that lack fish. Their breeding pools must also hold water for more than four months, providing enough time for larvae to develop. Look for Jefferson's or blue spotted salamanders in deciduous forests of New York, hiding under stones and rotting logs. These species migrate during the breeding season, and are subject to crushing by vehicles on warm (>40° F), rainy spring nights. Work with your community to identify road crossings during migration and alert drivers through the media or road signs.

Blanding's turtle, rare in New York, require large and diverse habitats and must travel long distances to satisfy their habitat needs and find nesting sites. They use vernal pools as "stepping stones" between larger wetlands, foraging for amphibian eggs and tadpoles. Areas with many vernal pools are critical. The loss of any vernal pool is detrimental to this species. Leave undisturbed travel corridors between vernal pools and other wetlands for dispersing turtles.

Marbled salamanders are rare in New York State, and are found in the Lower Hudson / Long-Island watersheds. They breed in vernal pools that flood in the late fall or early winter. The pools must hold water through the following spring in order for marbled salamander eggs to hatch. Vernal pools found in floodplain forests are preferred by breeding salamanders. This habitat type is under increasing pressure from development, particularly in southern New York where marbled salamander populations are most likely to be found. Permanent protection of these vernal pools is critical to the survival of this species in New York State.

new york state Comprehensive Wildlife Conservation Strategy

Cornell University Cooperative Extension

NEW YORK FOREST OWNERS ASSOCIATION — GROWING TOMORROW'S TREES TODAY — FOUNDED 1963

Some wildlife species found in vernal pools

The species listed here are closely associated with vernal pools, but many other wildlife species will use vernal pools at some time of the year for breeding or foraging. Follow stewardship guidelines to help maintain or enhance vernal pool habitats for these and other species that depend on these pools. The species below are listed as Species of Greatest Conservation Need as identified in the **New York State Comprehensive Wildlife Conservation Strategy.**

- Blanding's turtle
- Blue-spotted salamander
- Eastern spadefoot toad
- Fowler's toad
- Jefferson salamander
- Marbled salamander
- Spotted turtle
- Tiger salamander
- Wood turtle

Spotted turtle

Authorship

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About the Habitat Stewardship Series:

Much of the land in New York State is privately owned. Landowners are the primary stewards of our wildlife and woodlands, which also provide clean water, scenic views, fresh air, natural and cultural heritage, forest products, and recreational resources. The Habitat Stewardship Series has been created to help landowners and land managers recognize the habitats critical for wildlife species at risk, and to illustrate the role private landowners can play in sustaining these species through conservation, management, and sound stewardship.

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For information on woodland management, wildlife species of conservation need, and the **N.Y. State Comprehensive Wildlife Conservation Strategy,** go to: *http://www.dec.ny.gov/animals/30483.html, or http://www.nyfoa.org.*

Vernal Pools

Habitat Stewardship Series

A collaborative effort of :

The New York State

Department of Environmental Conservation,

The New York Forest Owners Association,

Cornell Cooperative Extension of Chenango County,

Cornell University Department of Natural Resources

Vernal pools...

are unique ***wetlands*** that provide critical breeding habitat for several amphibian species of conservation concern in New York. Learn to recognize these often inconspicuous pools, understand their habitat values, and discover what you can do to conserve these special wetlands.

A flooded vernal pool in the springtime

Vernal pools are wetlands with a seasonal cycle of flooding and drying. Some vernal pools flood in the spring with water from melting snow, rain or high groundwater and then are typically dry by summer's end. Other pools follow a similar pattern, but fill with rain in autumn, hold water all winter and spring, and then dry out by late summer. The annual drying cycle of vernal pools makes them different from other wetlands and plays a key role in determining which wildlife species use which pools as habitat. They have no fish, which prey on young amphibians.

Where do vernal pools occur in New York State?

Vernal pools are found in woodlands throughout New York State. They are easily overlooked in wetland inventories. As a result, most vernal pools haven't been adequately mapped, and scientists don't know how many pools have already been lost to development.

Plants of vernal pools

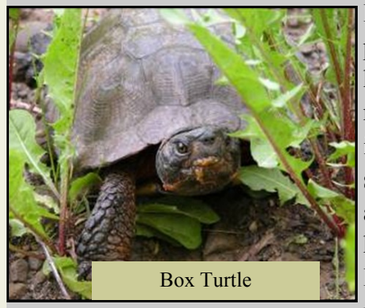
Some sunnier vernal pools may contain sphagnum moss, sedges, ferns and shrubs such as high-bush blueberry or buttonbush. Red maple and eastern hemlock commonly grow on the edges of vernal pools, although pools may be found in many different forest types. Dry vernal pools can sometimes be identified by the presence of dark, matted leaves within a depression in the ground.

A dry vernal pool in the summer

Why are vernal pools important?

Fish are top predators in wetlands, but they can't survive in pools that dry out. As a result, vernal pools provide key breeding habitat for amphibians whose tadpoles and larvae are especially vulnerable to fish predation; for example: wood frogs, spotted, blue-spotted, and Jefferson's salamanders. In the spring, amphibians migrate from nearby woodlands to vernal pools where they breed and deposit their eggs. Once hatched, tadpoles and larvae quickly develop into young frogs and salamanders that must leave the wetland before it dries up; early or mid-summer for wood frogs, late summer/early autumn for salamanders. Other species besides amphibians use vernal pools as habitat. Fairy shrimp are small crustaceans that require vernal pools for breeding. Spotted and Blanding's turtles, great blue herons, raccoons and predatory insects travel to vernal pools to feed on amphibian eggs, tadpoles, insects and crustaceans in the pools.

Threats from development



Box Turtle

Impacts of human development on vernal pools are the most significant threat to these habitats and their wildlife. Development and road-building destroys vernal pools, causing immediate loss of habitat and (for some species) permanent loss of populations. Many amphibians breed in the pools where they hatched, returning to the same pool every year. If one pool is lost, the pool's returning amphibians may be lost. While many vernal pools meet the regulatory definition of a wetland, some pools either don't meet that definition (for example, no vegetation) or are overlooked during wetlands mapping due to their small size and isolation. If construction of a new development will affect wetlands, it is often the small pools which get filled during construction and development.

Threats to surrounding woodlands

The time amphibians spend in a vernal pool is short but critical. They breed in the pool, but they spend about 11 months of the year in the surrounding woodlands, usually within 600 yards. Even when development plans avoid direct impacts to vernal pools, some amphibians may be lost when the woodlands surrounding the pools are altered.

Threats during migration

Many amphibians in New York migrate to their breeding pools in the spring along specific routes. Roads may cut across these routes, and vehicle traffic can kill migrating amphibians. Juvenile amphibians face similar threats during their dispersal from the pools after they are hatched.

Stewardship Guidelines for Vernal Pools

- ***Locate and identify*** the pools on your property.
- ***Avoid creating ruts and skid roads*** that collect or change the flow of water. Through runoff, these disturbances influence the timing of wet/dry periods in a vernal pool, altering the species that can breed there.
- ***Don't run heavy machinery through vernal pools*** wet or dry, to avoid changing the pool's ability to hold water.
- ***Avoid clearcutting trees*** in or around vernal pools. Removing the shade of the tree canopy heats up the air, soil, and water in the pool and changes the period of time that water remains in the pool.
- ***Retain ground cover*** within 300 feet of a pool, and in corridors between vernal pools, (logs, surface stones, deep leaf litter) as cover for amphibians, and maintain a moist environment on the woodland floor by retaining patches of cover shade.
- ***Enlist the services of a NYSDEC Cooperating Consulting Forester*** before conducting a timber harvest on your property.
- ***Follow timber harvesting Best Management Practices, (BMPs),*** and harvest timber near vernal pools only when the soils are either frozen (winter) or very dry (summer).

Guidelines for Maintaining Amphibian Diversity

- ***Focus conservation efforts*** on areas containing a variety of vernal pools and others that hold water all year long.
- ***Isolated pools***, with no inlets or outlets, are not likely to have fish, which prey on young amphibians.
- ***Small pools*** can have just as many (or more) breeding amphibians as larger wetlands; size isn't a good measure of habitat value.
- Most amphibians require wetlands that hold water at least ***four months during the year.***
- Pools that hold water for ***four to eleven months*** (including permanent wetlands) help protect against complete reproductive failures during dry years.
- Pools that hold water ***less than four months*** can still serve as foraging sites, wood frog breeding sites, habitat for insects and crustaceans, and stepping stones for amphibians migrating to new habitat.
- ***Clusters*** of vernal pools may be more productive for wildlife than single, isolated pools.